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Low levels of negative health and social outcomes among non-treatment heroin users in Glasgow (Scotland): Evidence for controlled heroin use?

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Objectives. This longitudinal study focused on 126 long-term heroin users who had never been in specialist treatment for use of any drug. The primary aim of the study was to assess whether this 'hidden' population resembled heroin users identified with drug treatment agencies, or alternatively, to test whether heroin could indeed be used in a controlled, non-intrusive fashion for an extended period of time.

Design and methods. Recruitment was achieved through chain-referred purposive sampling methods, and data was collected through two semi-structured interviews. 67% of participants were re-recruited for follow-up.

Results. Participants had levels of occupational status and educational achievement comparable to that in the general UK population, and considerably higher than typically found in heroin research. At the conclusion of the study, six participants had entered treatment. While there was evidence of intensive risky patterns of drug use among the sample, there was equal evidence for planned, controlled patterns of use. Some drug-related negative health and social outcomes had occurred on a lifetime basis, but ongoing problems were rare, and heroin was not a significant predictor in either context. In contrast to typical samples of heroin users, high levels of negative health and social outcomes did not appear to be inevitable within this sample. Frequency of heroin use was predicted by attributional items, indicating the importance of psychological factors in drug use and addiction.

Conclusions. Drug research should more fully incorporate previously hidden populations to more fully inform theory and practice. The pharmacological properties of specific substances should not be assumed to inevitably lead to addictive and destructive patterns of drug use.

It is customary to describe the effects of specific psychoactive substances with the assumption that these drugs affect different people in the same way. The pharmacology of psychoactive drugs is complex, but their chemical and neurological effects can be defined and explained (Wise, 1990). Confusion can arise, however, when the chemistry and physical effects of drugs are equated with a capacity intrinsic to these drugs to affect human *experience* and *behaviour* in a consistent and predictable way (Davies, 1992;

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Falk, 1983; Peele, 1985). Such an assumption has been described as ‘ . . . widespread, but it remains a fallacy’ (Gossop, 1993, p. 15). This paper deals specifically with the widely held assumption that heroin is ultimately addictive, and that given sufficient exposure to the drug, patterns of use will become intensive, prolonged and destructive, and will result in high levels of negative health and social outcomes (cf. National Institute on Drug Abuse [NIDA], 2000). Indeed, Robins, Compton, and Horton (2000) described heroin as being ‘ . . . widely believed to be the “worst drug in the world”’ (p. 530).

These assumptions have been challenged theoretically (Alexander, 1994; Davies, 1992; Robins, Helzer, Heselbrock, & Wish, 1980). These authors question the inevitability of negative outcomes through heroin use. It is argued that use of the drug, as with the use of other drugs, is as influenced by psychological and social factors as it is by the pharmacology of the drug. The overall theoretical framework most often cited from this perspective is that of *drug, set* (psychological factors) and *setting* (social factors), where drug use is studied according to these three factors separately and interactively (Cohen, 1995; Weil, 1972; Zinberg, 1984). As such, it follows theoretically that heroin, like any drug, should be able to be used in ways analogous to patterns of use of other drugs, including controlled use (Shewan *et al.*, 1998; Zinberg, 1984). In other words, it is argued that the pharmacological action of any substance, including heroin, should not automatically be conceptualized as a causal agent that overrides the influence of set and setting. A weakness in the argument presented by such theorists, however, is that the empirical evidence for this position specifically as it applies to heroin use is rare.

A useful parallel can be seen in research on cocaine use. Debate about the extent to which cocaine can be used in a controlled manner continues, with a growing body of literature supporting the position that cocaine use need not necessarily be addictive and destructive, and that users may not require treatment (Bielman, Diaz, Merlo, & Kaplan, 1993; Cohen & Sas, 1994; Hammersley & Ditton, 1994; Mugford, 1994; Reinarman, Murphy, & Waldorf, 1994; Waldorf, Reinarman, & Murphy, 1991). Furthermore, there is a body of research carried out among more visible populations (i.e. in drug treatment, or where participants are recruited initially through treatment contacts) of heroin users that indicates that heroin addicts can give up, or revert to less intensive and risky patterns of use without clinical intervention (Biernacki, 1986; Griffiths, Gossop, Powis, & Strang, 1994; Strang, Des Jarlais, Griffiths, & Gossop, 1992). Such research provides evidence for the existence of a continuum of patterns of heroin use, where the user would not necessarily progress to addictive, destructive use. It is still unclear, however, what would characterize the non-addicted, non-destructive end of the continuum: the end where controlled, non-intrusive heroin use should, in principle, be.

A study by Zinberg (1984) of patterns of opiate use among non-treatment users is the most frequently cited of its type. This study involved 61 *controlled*, 7 *marginal* and 30 *compulsive* heroin users in Boston, none of whom were in treatment for their drug use, and identified the importance of the interaction between drug, set, and setting, and the role of personality, situational, and social factors in regulating heroin use. Breakwell (1983), in a qualitative study of 51 non-dependent heroin users in London in 1975, stressed the importance of personal rules and immediate social norms in regulating use, and identified the processes of *drifting*, *controlling* and *overcoming* as components of controlled heroin use.

A more recent preliminary study of controlled heroin use was carried out by Shewan *et al.* (1998). This study was largely descriptive, involving semi-structured interviews

with 74 participants in Glasgow who had used opiates at least 20 times in the previous 2 years, who had never been in addiction treatment, and who had never served a custodial sentence. Typically, participants were experienced users of a range of non-opiate drugs and of different opiates, with most describing heroin as their 'main opiate of use'. Participants tended to have first used heroin at a relatively late age (mean 22.3 years). Heroin was rated by participants as the most enjoyable opiate to take, and self-ratings of dependence for light and moderate heroin users were low by comparison to clinical samples (e.g. Gossop *et al.*, 1995). Participants reported few major drug-related health and social problems.

While these studies provide important evidence that people can remain at the controlled end of a heroin using continuum, they also highlight the need for further research in this area, particularly that of a longitudinal nature. The present study seeks to contribute to this under-explored area of drug research. Specifically, the present study sought to test the hypothesis that heroin can be used over an extended period of time in a way that does not become associated with high levels of negative health and social outcomes. As such, this study seeks to investigate two specific arguments: (a) that heroin is inevitably addictive, (b) that sufficient exposure to heroin leads ultimately to intensive, prolonged and destructive use characterized by a range of negative health and social outcomes. Methodologically, this involved profiling a sample of ongoing heroin users who had never been in contact with drug treatment agencies and then tracking this sample over the course of at least 1 year to ascertain the stability of patterns of use and the occurrence of negative health and social outcomes. At both stages, the primary aim of the study was to assess whether the hidden population recruited for the study was one characterized by the 'devastating impact' (NIDA, 2000, p. 1) generally associated with heroin use, or alternatively, to test whether heroin could indeed be used in a controlled, non-intrusive fashion for an extended period of time.

Method

Participants were recruited in Glasgow between 1996 and 2000. The criteria for inclusion in this study were that participants had illicitly used opiates at least 10 times in each of the previous 2 years, had never received any specialist addiction treatment for any drug (including alcohol), and had never served a custodial sentence. A total of 126 participants were recruited for Phase 1, none of whom had previously taken part in research on illicit opiate use. Participants were recruited through chain referral methods (Biernacki & Waldorf, 1981; Griffiths, Gossop, Powis, & Strang, 1993) initially through 18 *subject zeros* (initial recruitment contacts) known to the researchers either through other studies or through existing research networks. From these initial contacts the sample was further recruited through word of mouth and informal meetings. Data were collected by way of semi-structured interviews, which were carried out by either the authors, or by fieldworkers with experience of drug research. The core elements of all interviews involved collecting data on socio-demographic details, behavioural data concerning use of opiate and non-opiate drugs (including injecting behaviour), and information regarding drug-related problems with regard to health, employment and/or education and debt. A set of scales designed to measure the following were incorporated

Q3 in each interview: general health (GHQ-28, Goldberg & Williams, 1988), dependence (Severity of Dependence Scale (SDS), Gossop *et al.*, 1995), and attributional style specific to drug use (Davies, 1992). Experience of drug overdose was assessed using the

checklist derived by Darke, Ross, and Hall (1996). Finally, a series of open-ended questions were asked concerning aspects of heroin use such as availability and source, information and advice, and potential help and support for drug problems.

A total of 85/126 (67%) participants were re-recruited for follow-up interview, which took place at least 12 months after the Phase 1 interview. The average time between Phase 1 interview and follow-up was 15.1 months. Various reasons can be offered for the attrition rate, including a reliance on subject zeros as a point of contact between the researchers and participants previously unknown to them. Subsequently, participants were lost to the study where contact was lost between subject zeros and participants or, in two cases, between the researchers and subject zeros.¹ While this strategy may have proved detrimental for re-recruitment, it was judged highly necessary in certain cases where participants were particularly concerned about confidentiality. Nevertheless, there were no statistically significant differences on the range of drug use, health and social variables listed in the previous paragraph between Phase 1 participants re-recruited for follow-up and those subsequently lost to the study, thereby allaying concerns regarding sample bias at follow-up.

Q4 Socio-demographic details of the sample

The Phase 1 sample comprised 94 male (94/126; 75%) and 32 (32/126; 25%) female participants, with an overall mean age of 28.5 years (range 19–48 years, $SD = 5.27$). The majority (72/126; 57%) were in a relationship, and 33% (41/126) had children. Participants were usually settled in accommodation, with 17% (21/126) owning their own home, 50% (63/126) renting from a private landlord and 21% (27/126) renting from the local authorities. The remaining 12% (15/126) reported 'other' living arrangements, such as staying with parents or friends.

In contrast to in-treatment heroin populations (e.g. Gossop, Mardsen, & Stewart, 2001) the present sample were mostly employed (93/126; 74%), and participants were well represented at the higher end of the employment spectrum, with 27% (34/123)

Q5 placed in occupational class I or II. A group of participants were full-time students in higher education (14/126; 11%), with a comparably sized group unemployed at the time of first interview (19/126; 15%). The latter group are comparable in size to the 12% recruited by Gossop *et al.* who were in any sort of employment, the contrast between the current sample and Gossop's sample being that the latter population were predominantly unemployed. Table 1 indicates that the employed members of the sample were representative of employment status among the general UK population (Office of Population, Censuses and Surveys, 1991). Taking fathers' occupation as a guide, employment was typically a feature of family background, and again occupational classes I and II were well represented, with 43% (52/120) of fathers placed in these categories.

Overall, the sample was well educated, with 81/126 (64%) having progressed to levels of education beyond secondary school. In combination with those of the sample currently in higher education, this is comparable with recent levels of the population currently in higher education in Scotland, recorded at 47% of the general population (Universities Scotland, 2001). Only six participants (6/126; 5%) from the present study reported no educational qualifications, considerably lower than the levels reported

Q6

¹ One of whom had moved abroad to work, one of whom had joined the armed forces.

Table I. Relative percentages of those employed by categories of occupational status for the present sample and the UK general population

% employed participants in each SES category	Occupational status (I = highest)				
	I	II	III	IV	V
Current sample	9%	29%	53%	9%	0%
General UK population	5%	23%	48%	18%	6%

among in-treatment heroin users. As an example of the latter, Morrison and Plant (1990) reported that 73% of their sample had left school before 16 years of age with no qualifications.

At Phase 2, the only significant changes in socio-demographic factors were that average monthly income increased ($t = 2.67$, $p = .009$) as did occupational status ($t = 2.52$, $p = .01$).

Results

Lifetime use of non-opiate drugs

Participants were typically experienced users of a range of non-opiate drugs. Most had at least tried the most common drugs, such as cannabis (100%), ecstasy (98%), amphetamines (98%), LSD (98%), and cocaine (97%), with a significant minority having tried less common drugs such as ketamine (44%) and crack cocaine (31%).

Injecting and sharing

A quarter of the sample at Phase 1 had *ever* injected drugs (32/126; 25%), of whom most had injected heroin (26/32; 81%). For most participants this could be described as past **Q7** ‘experimental’ drug-using behaviour, although four participants had been regular injectors but had ceased injecting and returned to non-injecting drug use. Similarly, while 15% (19/126 – 17/19 had injected heroin) of the sample had injected within the 2 years previous to interview, regular injecting was confined to a small subset of this group (6/19). This group had injected on average 445.8 times in the preceding 2 years, with two participants injecting on a daily basis. A similar residual tendency to previous risk was found with regard to sharing, with 12/32 having shared injecting equipment at some time, but only two participants sharing within the week prior to interview, with a further two having shared within the previous year. All participants who had shared said they knew whom they had shared with, with 8/12 having shared with one other person, and 4/12 with two other people. Four of the participants who had shared had been tested for HIV, with all testing negative.

At Phase 2, levels of injecting and sharing at follow-up were similar to those at Phase 1. Nine participants (9/85; 11%) had injected during this time, of whom four were injecting on a daily or near-daily basis. Three participants (3/85; 4%) had shared injecting equipment between Phase 1 and follow-up. All had shared with one person only, whom they knew. No participant had been tested for HIV between Phase 1 and follow-up.

Heroin use

Typically, participants were experienced users of a range of opiate drugs, and it is noteworthy that participants had been using heroin for an average of almost 7 years. A breakdown for lifetime use of opiates is given in Table 2.

Table 2. Use of opiate drugs among participants interviewed at Phase 1

Opiate drug	Ever used	First opiate used	Average no. days used previous 2 years	Mean number of years used	Mean age of first use
Heroin	124 (98%)	56 (44%)	Mean - 167.3 Median - 50 Mode - 25	6.8	21.4
Morphine	65 (52%)	5 (4%)	Mean - 6.3 Mode - 0	7.0	23.0
Dihydrocodeine	101 (80%)	17 (13%)	Mean - 27.6 Mode - 0	7.5	21.2
Opium	84 (67%)	25 (20%)	Mean - 7.1 Mode - 0	6.8	22.3
Methadone	69 (55%)	1 (1%)	Mean - 31.2 Mode - 0	5.2	23.8
Buprenorphine	60 (48%)	12 (10%)	Mean - 5.9 Mode - 0	6.8	21.8
Diconal	34 (27%)	2 (2%)	Mean - 2.9 Mode - 0	9.1	21.8

Overall mean first age used: 22.2 years. In addition, the following less common opiates had also been used by some participants: codeine 67/126; Pethidine 21/126; Physeptone 15/126; Palfium 9/126; fentanyl 6/126; Brompton's Cocktail 3/126; Narphen 2/126; Omnopon 2/126; Dromeran 1/126.

To profile patterns of heroin use among the sample, data were collected for verbal description, frequency of use, and amount used per session during the month preceding the Phase 1 interview, and for typical, light, and heavy periods of use. Table 3 indicates that there exists within the sample a residual potential for periods of intensive use, but overall there is reasonable evidence for more considered, less intensive, patterns of use.

Availability of heroin

The largest group (69/124; 56%) stated that heroin was 'very easy' for them to obtain, with 28% (35/124) saying it was 'fairly easy', and 10% (13/124) that for them the availability of heroin was variable. Smaller groups reported that for them heroin was either 'quite difficult' to obtain (5/124; 4%), or 'very difficult' (2/124; 2%).

Changes in opiate use at follow-up

No statistically significant shifts were detected with regard to levels of heroin use, either frequency or amount, when comparing the time period before Phase 1 interview with data collected at follow-up.² There were significant correlations between frequency of

² Where the time lag between Phase 1 and follow-up was greater than 12 months figures were adjusted accordingly.

Table 3. Patterns of heroin use for current, typical, heaviest, and lightest use

Verbal description	Use now	Use typically	Use heaviest	Use lightest
1. I use a little heroin, wait, then use some more	52/115 (45%)	64/112 (57%)	46/113 (41%)	51/110 (46%)
2. I use some heroin, then stop	28/115 (24%)	24/112 (21.5%)	14/112 (12%)	38/110 (35%)
3. I use heroin without stopping, until it is all gone	28/115 (24%)	24/112 (21.5%)	53/112 (47%)	10/110 (9%)
4. Not currently using heroin	8/115 (7%)	0/112 (0%)	0/112 (0%)	11/110 (10%)
	N missing = 9	N missing = 12	N missing = 12	N missing = 14
Period of use	Frequency (days per month)	Amount (g)		
Current	mean = 9.5 mode = 2.0	mean = 0.204 mode = 0.250		
Typical	mean = 9.95 mode = 2.0	mean = 0.254 mode = 0.254		
Heaviest	mean = 13.6 mode = 30	mean = 0.503 mode = 0.250		
Lightest	mean = 5.9 mode = 1.0	mean = 0.145 mode = 0.060		

heroin use during these respective periods ($r^2 = 0.49$, $p = .001$) and amount typically used ($r^2 = 0.55$, $p = 0.001$). A notable proportion of the follow-up sample (17/85; 20%) said they had not used heroin in the period between Phase 1 and follow-up.³ However, only two participants (2/85; 2%) said they would ‘definitely not’ use heroin again, with 15/85 (15%) saying they ‘might’. On further investigation of participants who had not used heroin between Phase 1 and follow-up, almost half (7/17) had used other illicit opiates. There were no significant differences between Phase 1 and 2 for participants who had *not* used between first interview and follow-up and those who had, for socio-demographic factors, drug use (including heroin), ratings on the SDS or the GHQ, nor for negative health or social outcomes.

Negative drug-related outcomes

Self-reported severity of dependence

The SDS comprises of five items, with the highest overall score being 15. Scores on the SDS were obtained for heroin and for the other main (non-opiate) drug of choice. Participants’ self-ratings for dependence on heroin (mean of 4.7) were slightly lower than for the other main drugs of choice, namely tobacco (8.3), cannabis (5.6), and alcohol (5.6). The overall scores were lower than those reported for a sample of heroin users in London (Gossop *et al.*, 1995), either in treatment (overall mean 10.3) or who had never received treatment (overall mean 6.6).

Negative drug-related health outcomes

At Phase 1, 38/126 (30%) of participants reported that they had ever experienced drug-related health problems. A smaller number (6/126; 5%) reported that they were

³ These participants were excluded from analyses specific to heroin use.

experiencing drug-related health problems at time of interview. In the majority of cases participants reported that they did not require medical attention, although four participants (4/126; 3%) reported attending hospital for treatment and four (4/126; 3%) reported seeing their own doctor as a result of drug-related problems. Heroin, either alone (5/126; 4%) or in combination with other drugs (9/126; 7%), was identified as a factor in drug-related negative health outcomes in some cases. However, there was slightly more of a tendency to identify use of non-opiate drugs (24/126; 20%), either alone or in combination with other non-opiate drugs, as factors. Specific heroin use variables such as numbers of years used, frequency and amount typically used, and self-ratings of dependence, were not related to health problems. Generally, participants seemed reasonably satisfied with their level of physical health, with 7% (9/119 - 7 missing cases) describing it as 'very good', 48% (57/119) as 'good', 38% (45/119), as 'okay', 6% (7/119) as 'fairly bad', and 1% (1/119) as 'very bad'. The majority of participants (85/126; 69%) said that they took regular exercise.

Q8 The General Health Questionnaire (28 item) was used to assess levels of mental health within the sample. At 18.1, the overall mean score for this measure was close to but below the threshold of 23/24 for psychiatric caseness suggested by the authors of the scale (Goldberg *et al.*, 1997). The discrepancy between mean and mode scores on the scale and the high standard deviations indicate that overall scores are being driven higher by a significant proportion of the sample, rather than being perhaps representative of the sample as a whole. Particularly low scores were recorded for depression among the sample. The scores for the subscales were as follows. Somatic: mean = 4.4, mode = 2.0, $SD = 3.5$; Anxiety: mean = 5.1, mode = 0, $SD = 4.73$; Social Dysfunction: mean = 6.6, mode = 7.00, $SD = 3.06$; Severe Depression: mean = 2.0, mode = 0, $SD = 3.4$. Higher scores overall on the GHQ-28⁴ were predicted by higher scores on the SDS for heroin use ($\beta = .27$, adj. $r^2 = .05$, $p = .007$), and by the number of units of alcohol typically drunk in one session ($\beta = .23$, adj. $r^2 = .04$, $p = .02$). It should be noted, however, that these variables explained only 9.7% of the variance.

As would be expected due to the time factor involved, participants reported lower overall levels of negative health outcomes at follow-up than for lifetime data collected at Phase 1. A small group of participants (4/85; 5%) reported drug-related health problems between Phase 1 and follow-up. Medical attention was sought in three of these cases. The most serious of these health problems was where one participant reported they had contracted hepatitis C, which they attributed to their heroin use. Participants again typically thought they were in reasonably good health: 7% (6/85 - 6 missing cases) reported their health as being 'very good', 47% (40/85) as 'good', 31% (26/85) as 'okay', 7% (6/85) as 'bad' and 1% (1/85) as 'very bad'. A majority of the sample 46/85 (54%) said that they took regular exercise. GHQ-28 scores were similar to those found at Phase 1, with an overall mean score of 17, and were significantly correlated (Pearson's $r = .36$, $p = .000$). Unlike at Phase 1, higher GHQ-28 scores were not predicted by heroin use or heroin-related variables (such as the SDS).

Drug overdose

The level of certain lifetime overdose symptoms reported by the sample was worrying, but the drug most frequently reported was alcohol, either alone or in combination with

⁴ Higher scores on the GHQ are reflective of poorer mental health.

other non-opiate drugs. Heroin, while a factor in some overdoses, would appear to play a much lesser role, as shown in Table 4.

Table 4. Participants' reporting aspects of lifetime drug overdose (cf. Darke *et al.*, 1996)

Overdose symptom	No. reporting symptom	Main drug(s) involved	No. involving heroin	No. involving medical attention
Serious difficulty with breathing	24/126 (19%)	No clear pattern	6/24 (25%)	3/24 (13%)
Turned blue	7/126 (6%)	Heroin (4/7)	4/7	2/7
Collapsed inside or in street	50/126 (40%)	Alcohol (19/50; 38%)	5/50 (10%)	10/50 (20%)
		Alcohol + other drugs (17/50; 34%)		
Lost consciousness and couldn't be roused	44/126 (35%)	Alcohol (18/44; 41%)	3/44 (7%)	3/44 (7%)
		Alcohol + other drugs (15/44; 34%)		
Vomited while unconscious	21/126 (17%)	Alcohol (13/21)	0/21	0/21
		Alcohol + other drugs (8/21)		

Again, as would be expected due to the time factor involved, drug overdose was less common at follow-up than for lifetime experience. The most common overdose symptom reported was losing consciousness and being unable to be roused (12/85; 14%). Alcohol, either alone or in combination with other non-opiate drugs was the main factor identified in these cases (9/12), although heroin was identified as the main drug involved in a small number of cases (3/12). Collapsing inside or in the street was reported by a relatively small number of participants (8/85; 9%). Again, alcohol (alone or in combination) was the drug most commonly identified (6/8), with heroin being identified in a smaller number of cases (2/8). The only other overdose symptom reported was having serious difficulty breathing (4/85; 5%), with heroin being identified as the drug involved in all of these cases (4/4). Medical attention was not received in connection with any of these overdose symptoms. No participant reported turning blue or vomiting while unconscious.

Negative social outcomes

A group of participants (19/126; 15%) reported that their heroin use had been associated with family problems, although only one participant reported that this had led to the break-up of a long-term relationship, and no participant reported such outcomes as their children being taken into care. In most cases, participants described the nature of these family problems as 'concern' over their using heroin, rather than actual outcomes.

More than half of the sample (74/126; 59%) reported that their drug use had ever negatively affected their employment and/or education, with 38% (48/126) reporting that this had happened on more than one occasion. A smaller proportion (10/126; 8%), however, reported that these problems were ongoing, and in terms of outcome, only two participants (2/126; 2) reported actually losing their jobs, and one participant (1/126; 1%) being forced to leave university. Similarly as with drug-related health

problems, heroin, either alone (14/126; 11%), or in combination with other drugs (12/126; 10%), was identified as a factor in drug-related problems with employment and/or education in some cases. Once again there was slightly more of a tendency to identify use of non-opiate drugs (48/126; 38%), either alone or in combination with other non-opiate drugs, as factors.

At Phase 2, a significant minority (11/85; 13%) of the sample reported drug-related family problems. What could be described as tangible outcomes were confined to three of the follow-up sample. One participant had been 'disowned' by their family, one had split up from a long-term partner, and one had lost access to his son and was involved in a court case over custody. As at Phase 1, there was evidence of what could be described as 'family tension' over the remaining eight participants' heroin use, rather than negative outcomes.

The main change from Phase 1 was a proportional increase in participants who reported drug-related problems with work and/or education (23/85; 27%), and a relatively higher proportion who attributed this to their heroin use (10/23). In terms of outcomes, however, results were similar to Phase 1, in that only one participant (1/85; 1%) lost their job, with two participants (2/85; 2%) being given written warnings by their employers.

Specialist addiction treatment

At the conclusion of the study, 7% (6/85) of the follow-up sample had entered specialist treatment for their drug use. All reported entering treatment as a result of concern over their heroin use and deterioration in health, although one participant also cited an ongoing child custody case as a motivation. Five of these participants were injecting heroin prior to entering treatment (mean 298.0 times in the year previous to interview), and all were typically daily or near daily users of heroin. Only one participant reported they were not on prescription, having refused the offer of this service, with the remaining five all being prescribed methadone. None of the other Phase 2 participants reported that they perceived the need to enter treatment intervention.

Comparisons between light, moderate, moderate-heavy, and heavy users of heroin

To provide further profiling, the sample as a whole were categorized under four groups, based on number of days using heroin in the 2 years preceding Phase 1 interview. These groups were *light* (up to 25 days used, mean = 13.1, $N = 35$), *moderate* (25–50 times, mean = 35.6, $N = 34$), *moderate-heavy* (over 50 times–200 times, mean = 137.6, $N = 25$), and *heavy* (more than 200 times, mean = 536.3, $N = 29$).⁵

No differences were found between the groups for socio-demographic variables (including age, gender, occupational status, and education). Nor were there significant differences between the groups for drug-related health problems, for scores overall or on subscales of the GGHQ-28, or family employment/education problems. There were few differences between the groups with regard to their use of non-opiate drugs, with the only major difference being a main effect for the total number of non-opiate drugs ever tried (ANOVA, $F = 3.83$, $p = .01$). *Post hoc* tests indicated that this was a result of

⁵ Missing cases = 1. The two participants whose illicit use of opiates did not include heroin are excluded from this and subsequent heroin-specific analyses.

the *light* heroin using group using more non-opiate drugs than the *heavy* heroin using group (Tukey; mean difference = 1.25).

There were differences between the groups for the length of time they had been using heroin (ANOVA, $F = 3.17$, $p = .03$). Intriguingly, the only *post hoc* significance between-groups difference was that the *heavy* group had been using heroin for longer than the *moderate* group (Tukey; mean difference = 3.89). There was no significant effect for age at which participants had first used heroin, nor were significant differences found between the groups for average amount of heroin used per session. There was a main effect for the number of times injected heroin in the 2 years preceding interview (ANOVA, $F = 5.41$, $p = .002$). *Post hoc* tests indicated that this effect arose from the *heavy* user group being more likely to inject than the *light* group (All *post hoc* tests Tukey; mean difference = 89.1), the *moderate* group (mean difference = 83.1) and the *moderate-heavy* group (mean difference = 89.1, $p = .009$). No other differences were found between groups. No significant main effect was found for age at which first injected heroin, or for total number of years injecting heroin.

A strong main effect for overall scores on the SDS was observed (ANOVA, $F = 29.5$, $p = .0001$). Between groups analyses revealed that the *heavy* user group self-rated as being significantly more dependent than the *light* group (All *post hoc* tests Tukey; mean difference = 7.1), the *moderate* group (mean difference = 6.2), and the *moderate-heavy* group (mean difference = 3.1). The *moderate-heavy* group scored higher than the *light* user group (mean difference = 4.1) and the *moderate* group (mean difference = 3.1). No significant difference was found between the *moderate* group and the *light* user group. From the group breakdown for overall scores on the SDS, both the *light* (mean = 1.8) and *moderate* (mean = 2.7) groups are below the London samples described by Gossop *et al.* (1995), with the *moderate-heavy* group (mean = 5.8) and the *heavy* group (mean = 8.9) scoring at comparable levels.

Attributions for heroin use

A series of eight attributional items based on combinations of the dimensions of internal-external (I-E), stable-unstable (S-Uns), and controllable-uncontrollable (C-Unc) were presented to participants (cf. McAllister & Davies, 1992). These items were scored 1-10, where higher scores represent an agreement by the participant that the attribution in question provided what they considered to be a good explanation for their heroin use. Significant main effects were observed for four of these items, as shown in Table 5 (data analysed by ANOVA). The attributions which did not show significant

Table 5. Differences for attributions for heroin use by categories of levels of heroin use

Item	Dimensions	F	Sig.
A. I use heroin because of long-term situations in my life I can't control	E-S-Unc	7.56	.001
B. I use heroin constantly, I don't want to but I can't control it	I-S-Unc	13.79	.001
C. I use heroin occasionally because I want to and choose to for myself	I-U-C	21.96	.001
D. I use heroin constantly, I want to and choose to for myself	I-S-C	14.02	.001

effects in the analyses were: 'I use heroin because of the people I choose to spend most of my time with' (E-S-C), 'I use heroin because of the mood I am sometimes in' (I-Uns-Unc), 'I use heroin because of the situations I sometimes get myself into' (E-Uns-C), and 'It's largely a matter of luck whether I use heroin or not' (E-Uns-Unc).

These attributions shown in Table 5 can be divided into those that provide an 'addicted' explanation (A and B) and a 'controlled' explanation for heroin use (C and D). These proved to be effective discriminators between the groups. For attribution A, the *heavy* user group scored significantly higher than the *light* group (All *post hoc* tests Tukey; mean difference = 3.1), the *moderate* group (mean difference = 2.6), and the *moderate-heavy* group (mean difference = 2.1). No other significant differences were found. For attribution B, the *heavy* user group scored significantly higher than the *light* group (mean difference = 3.4), the *moderate* group (mean difference = 3.7), and the *moderate-heavy* group (mean difference = 2.7). Again, no other significant group differences were found. For attribution C, the *heavy* user group scored significantly lower than the *light* group (mean difference = 4.4), the *moderate* group (mean difference = 4.7), and the *moderate-heavy* group (mean difference = 4.4). Once again, no other significant group differences were found. Finally, for attribution D, the results were intriguing: the *heavy* user group scored significantly higher than the *light* group (mean difference = 4.9), the *moderate* group (mean difference = 3.9), and the *moderate-heavy* group (mean difference = 3.4). Again, no other significant group differences were found. To summarize, these attributional items provide a distinction between the heavy user group and all three other groups, with there being no differences between the three lighter using groups. There also exists a contradiction in these findings, in that this pattern persists with attribution D, despite this attribution being in direct contrast to attribution B.

Predicting higher levels of heroin use

Stepwise multiple regression analysis was carried out to identify factors predictive of frequency of heroin use. Independent variables entered in this analysis included socio-demographic variables, drug use history, and measures of health and personality. The two variables which came through as predictive were the internal-unstable-controllable attribution ('I use heroin occasionally because I want to and choose to for myself'; $\beta = -.55$, Adj. $r^2 = .564$, $p = .001$), and self-ratings on the SDS for heroin use ($\beta = .31$, Adj. $r^2 = .005$, $p = .001$; overall variance explained = 61.4%).

Predictors of higher levels of heroin use between Phase 1 and follow-up

While there was no significant shift in levels of heroin use between Phase 1 and follow-up, a stepwise multiple regression analysis similar to that carried out at Phase 1 was used to identify predictors of higher levels of heroin use within the sample at follow-up. As at Phase 1, the internal-unstable-controllable attribution item was the strongest predictor of levels of heroin use ($\beta = -.54$, Adj. $r^2 = .577$, $p = .001$), along with number of times used heroin in the 2 years preceding the Phase 1 interview ($\beta = .30$, Adj. $r^2 = .099$, $p = .004$), and the total number of years since first used heroin ($\beta = .20$, Adj. $r^2 = .024$, $p = .04$; overall variance explained = 70.0%).

Discussion

The participants described here are typically experienced users of a range of opiate and non-opiate drugs, including heroin. In contrast to typical samples of heroin users, levels

of educational achievement and occupational status were comparable to those found in the general UK population. High levels of negative health and social outcomes were not a major feature of this group. While there was evidence of lifetime difficulties with health and with social factors such as family and employment, ongoing problems were rare, and heroin was not a significant predictor in either context. While there was evidence of intensive risky patterns of drug use among the sample, particularly with regard to alcohol, there was equal evidence of more controlled, planned patterns of use. Attributions were shown to be the main predictor of frequency of heroin use, demonstrating the importance of psychological factors in drug use. At the conclusion of the study, six of those participants recruited for follow-up had entered specialist drug treatment. None of the other Phase 2 participants reported that they perceived the need to enter treatment intervention.

Whether this sample could be described as 'controlled heroin users' remains open to debate. For example, a proportion of the sample self-rated as dependent on heroin, which would appear to be contradictory to most definitions of controlled behaviour. For the majority of this group, however, their self-identification of addiction was not sufficient to lead them to treatment. Among other participants, those who used heroin on a more moderate basis, self-ratings of dependence on heroin were low, and they reported few problems in relation to their heroin use. However, the indication of negative outcomes associated with their use of other drugs, particularly alcohol, would challenge a definition of this group as *controlled drug users*. The findings here primarily identify the relative nature of any definition of controlled heroin use, both specifically and within the broader context of general drug use, and raise the need for further research to clarify such definitions. We would suggest that the term *unobtrusive heroin use* could be usefully employed as a starting point for such research. This term recognizes that some patterns of heroin use can be relatively non-intrusive to the individual user and to society, and also incorporates the recognition of a continuum of heroin use without making assumptions about the inevitability of movement along that continuum (Shewan *et al.*, 1998; Strang *et al.*, 1992). This could be an important step in developing a more integrative theoretical understanding of drug use and addiction, one that does not rest primarily on assumptions about the causal effects of simply taking a particular drug.

The results contained here should be interpreted with caution until fully replicated. It is interesting to note that this study contrasts with much heroin research not just in outcome but also in terms of research objectives. The clear implication here being that drugs research should more fully incorporate data with traditional sampling sites and more fully explore patterns and trends among previously hidden drug-using populations. In some ways, the lack of typical outcomes among heroin users (such as imprisonment and treatment) within the present sample highlights the need to look more closely at the subtle psychological factors that influence drug use, including heroin use. The finding that frequency of heroin use was largely predicted by attributional style supports this position. This is perhaps hardly startling in social research terms. It can be seen, however, to be contrary to received wisdom concerning drugs and drug-using behaviour. For example, the following statement indicates the extent to which, in medical quarters, pharmacology is believed to 'dominate' human behaviour:

Just as a virus can take over and direct the synthesis of proteins within a cell, these extrinsic reinforcers (alcohol and other addictive drugs) dominate brain mechanisms related to anticipation, and purposeful (motivated) behaviour (Meyer, 1996, p. 163).

In this paper, albeit with the qualifications expressed earlier in this section, the concept of controlled heroin use is presented to challenge the pharmacentric model of heroin use, which proposes that that heroin is a substance *which does things to people* and that it *makes them do things against their will* (cf. Davies, 1992). Indeed the very concept of controlled drug use involves an element of choice and decision making on the part of the individual. This is a crucial element of *set*. The traditional model of addiction would suggest that when people use addictive drugs, then this cognitive component is at least reduced (Meyer, 1996), and that this particularly applies to heroin (Carnwath & Smith, 2002; NIDA, 2000; Robins *et al.*, 2000). We would dispute that cognitions are somehow replaced by a physiological need to continue drug use that has an overwhelming effect on behaviour.

The work of Davies (1992, 1997) and Orford (1984) in particular suggests that addiction is as much a cognitive state as a physiological one. The addicted *set*, therefore, could be characterized by a narrowing of the repertoire of choice available to the drug addict, either subjectively or objectively: subjectively in that the addict believes he or she is addicted (Eiser, 1982; Eiser & Gossop, 1979), objectively in terms of the social pressures which come to surround the addict (Cohen, 1990; Davies, 1992, 1997; Orford, 1984), and indeed the tangible legal sanctions (Cohen, 1990). The contribution of psychological factors in addiction is rarely disputed. Regarding these factors as secondary is to neglect what would appear to be a component that is equally as important as drug pharmacology in the addictive process.

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